B. CONS.ENGG. 3RD YR 1ST. SEM. EXAM.-2019

THEORY OF STRUCTURE – II

Time : Three hours

Full Marks : 100

(Use separate answer script for each Part)

PART I

Answer any **two questions**. Assume suitable data not provided

1. Analyse the frame by **slope-deflection method** and draw the final bending moment diagram of the frame as shown in Fig.1. The size of beam BC is 250 mm X 400 mm and the side of the square columns AB & DC are 350 mm and 250 mm respectively. E = 2.5 X 10^4 MPa for all the members.

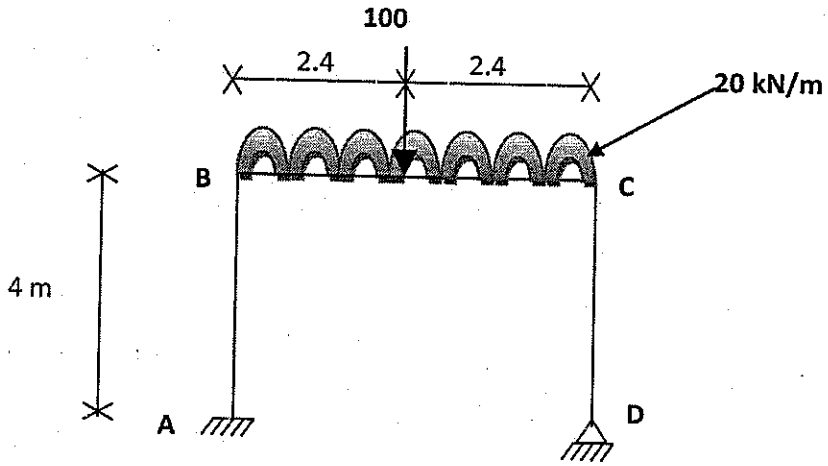


Fig.1: Frame (2D) Problem

2. Analyse the continuous beam as shown in Fig.2 by **Moment Distribution Method** and draw the final bending moment and shear force diagram. E = 3.0 X 10^4 MPa. The depth of beams PQ, QR, RS and ST are 300 mm, 500 mm, 400 mm and 350 mm respectively. The width of all the beams are 250 mm.

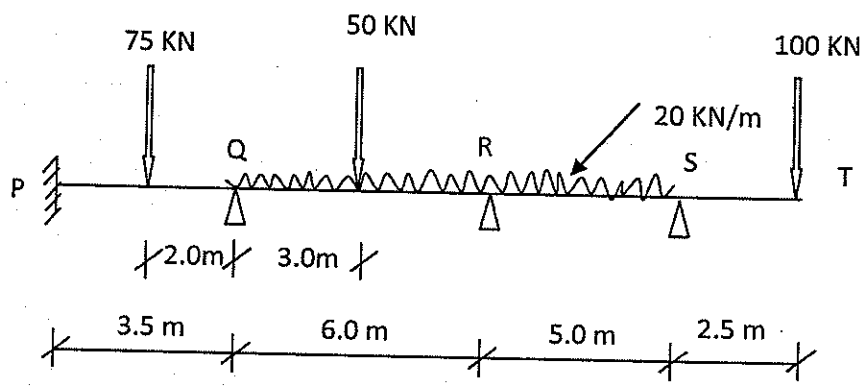


Fig: 2 Continuous Beam

[Turn over

3. Evaluate the horizontal and vertical components of deflection of the free end R of the truss as shown in Fig.3 by **matrix method of analysis.**

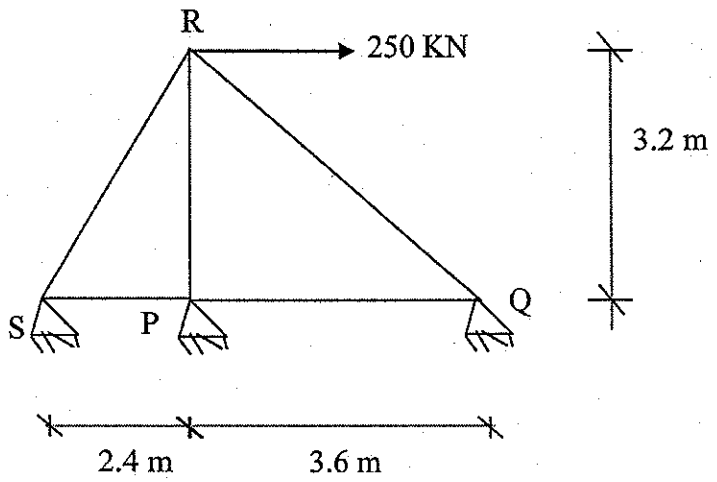


Fig. 3: Truss Problem

All the truss members are made of single angle 100 X 100 X 10 having cross sectional areas of 19.0 cm^2 . The modulus of Elasticity E = 2.1 X 10^5 MPa for all members. Calculate also the member force of RS of the truss.

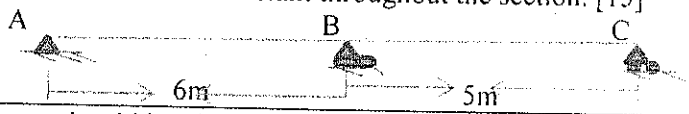
EX/CON/T/314/2019

B. Construction Engineering 3rd year 1st Semester Examination – 2019

Subject: Theory Of structure-II

Total Time: 3 hour
Full Marks: 100

PART-II(Full Marks-50)
Answer all the questions.

CO6 [15]	[1] (a)Determine the horizontal thrust developed in a two hinge semicircular arch of radius R subjected to a concentrated load P at the crown.[10] (b) Established the equation of horizontal thrust of two hinge parabolic arch[5]
CO6 [10]	[2] A three hinge circular arch hinged at the springing and crown points has a span of 40m and central rise of 8m. It carries a UDL of 20 KN/m over the left half portion along with a concentrated load of 100 KN at the right quarter span point. Find the reactions at support, normal thrust and shear at a section 10m from the left support.
CO5 [25]	[3] (a)What do you mean by ILD. State & explain the "Muller Breaslau" Principle. [10] (b) Compute the ordinates of ILD for reaction R_A for the beam shown in figure at 1 meter interval and draw the ILD. The moment of inertia is constant throughout the section. [15] 

The students of the course should be able to

CO1: Analyse of continuous beam by Slope Deflection & Moment Distribution Method (K4).
CO2: Deduce & Analysis of Structures by Matrix Method (K4)
CO3: Explain Finite Element Method for Structural Analysis (K2)
CO4: Enumerate the use of computer for structural analysis (K1)
CO5: Describe & Construction of Influenced Lines (K2)
CO6: Calculate the reaction forces for Two & Three Hinge Arches (K3)